ST. CLAIR TUNNEL, PORT HURON PUMP HOUSE
Southwest of Port Huron (west) portal of the
St. Clair Tunnel
Port Huron
St. Clair County
Michigan

HAER No. MI-67-A

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Northeast Region
U.S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

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HISTORIC AMERICAN ENGINEERING RECORD

ST. CLAIR TUNNEL, PORT HURON PUMP HOUSE HAER No. MI-67-A

Location: Southwest of the Port Huron (west) Portal of the St. Clair Tunnel, Port Huron, St. Clair County, Michigan

UTM: 17.383080.4757160
Quad: Port Huron, MI, 1:24,000

Dates of Construction: 1890-1891; 1908

Engineer: Joseph Hobson and others

Present Owner: St. Clair Tunnel Company, 1333 Brewery Park Boulevard, Detroit, Michigan 48207-9998

Present Use: Pumping station for the removal of surface runoff from the Port Huron approach to the St. Clair Tunnel.

Significance: This pump house has served as a critical component of the drainage system built to prevent surface runoff from the 11.50-acre watershed created by the open-cut approach to the Port Huron (west) portal of the St. Clair Tunnel from entering into the tunnel. The pumping equipment in place today is of recent vintage and is the fourth generation of equipment to operate in this pump house.

Project Information: This documentation is the result of a Memorandum of Agreement among the Michigan State Historic Preservation Office, the Advisory Council on Historic Preservation, the Department of the Army, Corps of Engineers, Detroit District and the Canadian National North America Railroad as a mitigative measure before the closing of the tunnel. It was completed in 1993 by Charles K. Hyde, Wayne State University, Detroit, Michigan 48202

ORIGINAL DRAINAGE SYSTEM AND SUBSEQUENT ALTERATIONS

Surface runoff water from the 11.50-acre watershed created by the open cut approach to the Port Huron tunnel portal would have quickly flooded the tunnel had no provision been made to pump it away from the tunnel entrance. The water collected in a pair of drains that ran parallel to the retaining walls that extend 1,656 feet west from the portal. The drains, created by the retaining wall on one side, the ballast wall on the other side, and paving stones serving as the base, measured 1 foot 10 inches high and varied in width from 3 feet 3 inches at the westernmost part of the approach to 2 feet 6 inches at the pump house. The drains carried the runoff toward the tunnel entrance, where the water was diverted into a sump or well hole on the south side of the approach. A stone-lined culvert, 2 feet high and 3 feet wide, passed under the tracks and connected the drain on the north side of the tracks to the well hole, which measured 5 feet in diameter and 19 feet deep. The original system of drains, culverts, and well hole remains intact to this day.

The original pumping equipment consisted of two 17-inch X 14-inch X 15-inch Worthington duplex pumps and two additional steam pumps (18.50 inches X 14 inches X 10 inches), with a combined capacity of about 7,200 gallons per minute. A large boiler house, roughly 50 feet wide and 120 feet long and located southwest of the pump house, but on the grade level of the surrounding land, supplied steam to the pumps through a 6-inch steam line. The pumps drew water from the well hole through two suction pipes, one of 12-inch diameter and the other of 6-inch diameter and then delivered the water up the nearby grade through two 6-inch delivery lines and a single 14-inch line. The pump house roof originally carried a round sheet metal ventilator mounted over a 24-inch diameter ventilation shaft. None of this equipment survives.[1]

As part of the electrification project of 1908, the tunnel company removed the original pumping equipment and dismantled the boiler house. The tunnel company installed two centrifugal pumps, each with a capacity of 4,000 gallons per minute, and each driven by 100 horsepower, 3-phase, 25-cycle, 3,300 volt electric motors manufactured by Westinghouse. This second generation of equipment has not survived either.[2]

At some point in the 1920s, the tunnel company replaced the centrifugal pumps driven by electric motors with new pumps driven by an 8-cylinder gasoline marine engine manufactured by the Sterling Engine Company of Buffalo, New York. The tunnel company installed the same Sterling engines at the Port Huron and Sarnia pump houses. Each developed 300 horsepower @ 1,550 RPM. The engine and pumps at Port Huron were replaced sometime in the 1950s by Ingersoll-Rand pumps driven by electric motors.

DESCRIPTION OF THE PUMP HOUSE

The building is located southwest of the Port Huron (west) portal, with the east facade roughly 26 feet 6 inches west of the wing wall. The pump house foundations and walls consist of the same coursed, quarry-faced (rough-cut) limestone blocks, with cement mortar joints, as the ashlar masonry making up the nearby portal, wing walls, and retaining walls found in the Port Huron approaches and portal. The individual limestone blocks are 2 feet in height and range in length from 24 to 70 inches. The pump house is a rectangular building measuring 20 feet by 36 feet in plan, with walls 12 feet high from the foundations to the roof line. The north wall is 2 feet thick, while the remaining three walls are 3 feet thick above grade. Below grade, the south wall of the building is 8 feet thick, serving as a retaining wall to hold back the embankment to the south. The hipped roof, supported by a standard king post roof truss, has a recently-applied sheet metal covering.

The north facade originally had two windows, each with 4 rectangular panes of glass, an arched lintel, and a rectangular sill, both of finished limestone. The western window has since been converted into a door roughly 7 feet high. The building still has its original set of two doors that swing inward. These measure 5 feet wide and 7 feet 6 inches high and have arched top rails.

NOTES

[1]Engineering drawing, "St. Clair Tunnel--Portal," Front Elevation and Plan, undated drawing, showing the portal as built; engineering drawing, "St. Clair Tunnel - Pump House - Pt. Huron," Drawing No. 219, Joseph Hobson, Hamilton, Ontario, 26 November 1890; engineering drawing, "St. Clair Tunnel - Arrangement of Pumps - Pump House - Pt. Huron," Drawing No. 228, Joseph Hobson, Chief Engineer, Hamilton, Ontario, 17 February 1891; and Canadian Westinghouse Company, Ltd., The Substitution of Electric For Steam Operation in the St. Clair Tunnel (December 1904), p. 16. The engineering drawings came from the offices of the Canadian National Railway Engineering Department in Toronto.

[2]F. A. Sager, Electrification of the St. Clair Tunnel, An Illustrated Technical Description (Montreal: Grand Trunk Railway System, 1908), p. 16.

SOURCES OF INFORMATION

A. Architectural Drawings: The Canadian National Railway Engineering Department, 277 Front Street West, Toronto, Ontario, M5V 2X7, has an extensive collection of drawings covering all aspects of tunnel construction and operating equipment. This is a safe repository and the drawings are likely to be preserved in a permanent archives once the historic tunnel is closed.

B. Historic Views: Several major sources of historic views were identified. The Museum of Arts and History, 115 Sixth Street, Port Huron, Michigan 48060, has about two dozen historic views. The Holland-Paisley Collection of Historical Photographs, 151 Vidal Street North, Sarnia, Ontario, has a similar number. The Canadian National Railway's archives has additional views. Many historic views are held by private collectors and are not readily accessible to researchers.

C. Bibliography

1. Primary and Unpublished Sources:

Grand Trunk Western Railroad Collection held by the Bluewater Michigan Chapter of the National Railway Historical Society, P.O. Box 296, Royal Oak, MI 48068. Materials relating to the St. Clair Tunnel include property maps, reports of the directors of the St. Clair Tunnel Company, statements of construction expenses, and a voluminous correspondence between Thomas E. Hillman, first assistant engineer for the tunnel project, and Joseph Hobson, the chief engineer.

Klohn Leonoff, Ltd., compilers. Historic Tunnel Documents From National Archives of Canada and National Library of Canada (Klohn Leonoff, Ltd., Mississauga, Ontario, 1991). The materials include correspondence copied from the Sir Joseph Hickson Papers, MG29 A29, National Archives of Canada.

C. Bibliography (continued):

2. Secondary and Published Sources:

Canadian Westinghouse Company, Ltd. The Substitution of Electric For Steam Operation in the St. Clair Tunnel, Grand Trunk Railway System (Proposal dated December 1904).

Gilbert, Clare. St. Clair Tunnel: Rails Beneath the River (Erin, Ontario: The Boston Mills Press,

Kenn, John. "The St. Clair River Tunnel." Inland Seas, Vol. 31, Fall 1975, pp. 175-185.

La Moille, T. G. "The St. Clair River Tunnel." Harper's Weekly, Vol. 35, February 28, 1891, pp. 158-159.

Sager, F. A. Electrification of the St. Clair Tunnel: An Illustrated Technical Description (Montreal: Grand Trunk Railway, 1908).

"The St. Clair River Railway Tunnel." Port Huron Daily Times--International Tunnel Opening Edition, Vol. 20, No. 155, Part 2, September 19, 1891.

"The St. Clair Tunnel Drainage System." Scientific American, Vol. 65, December 12, 1891, p. 373.

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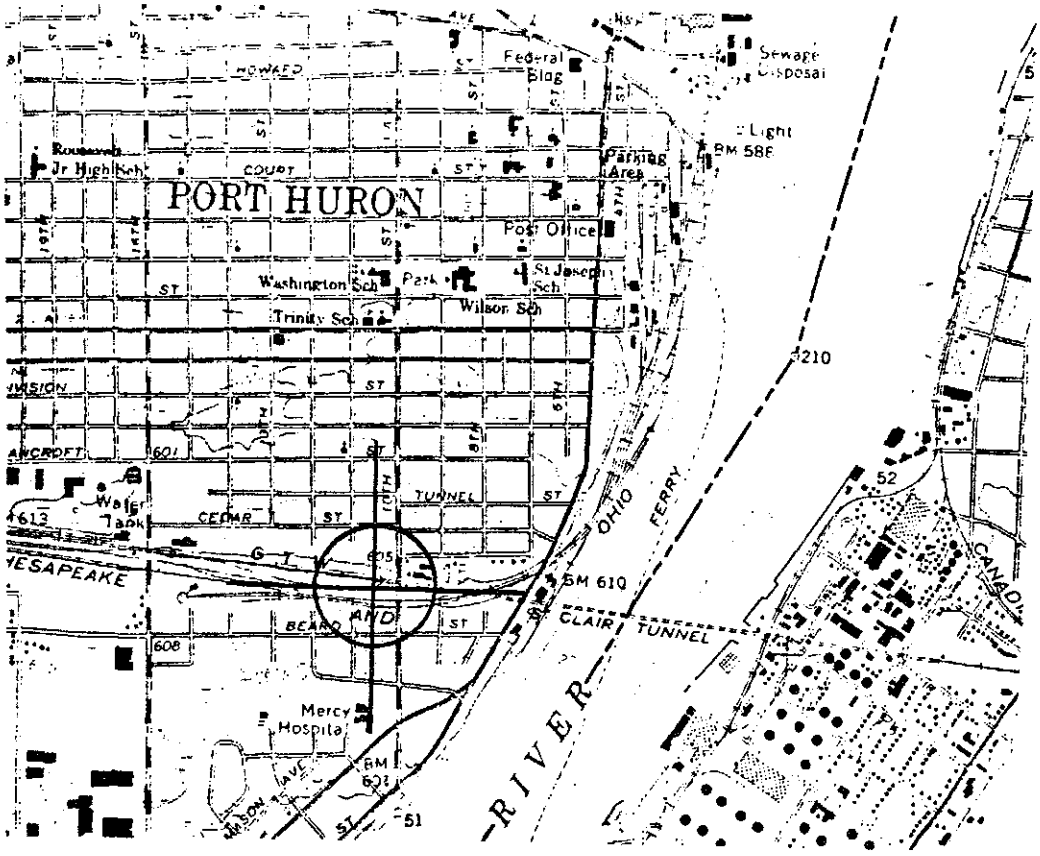
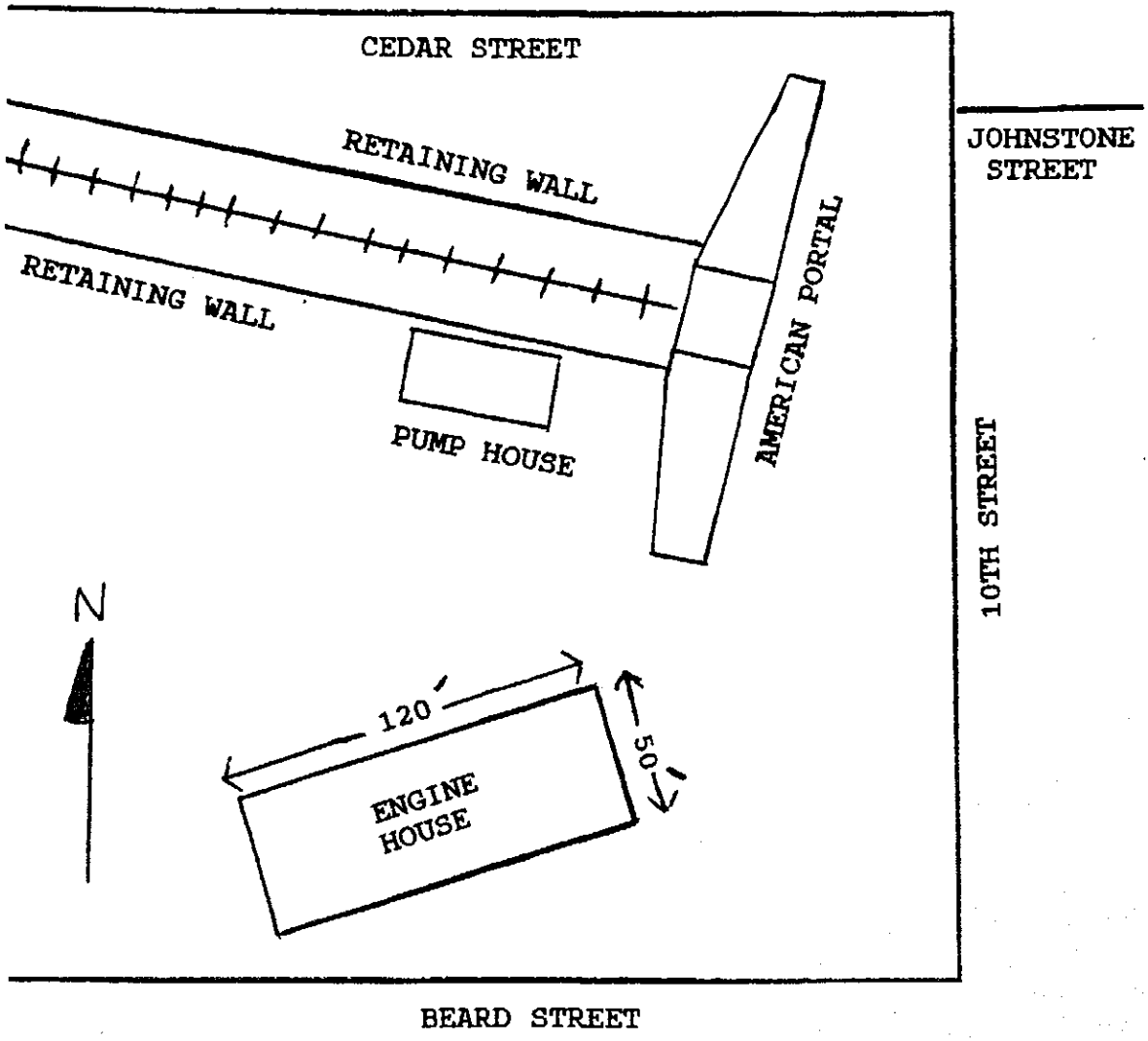
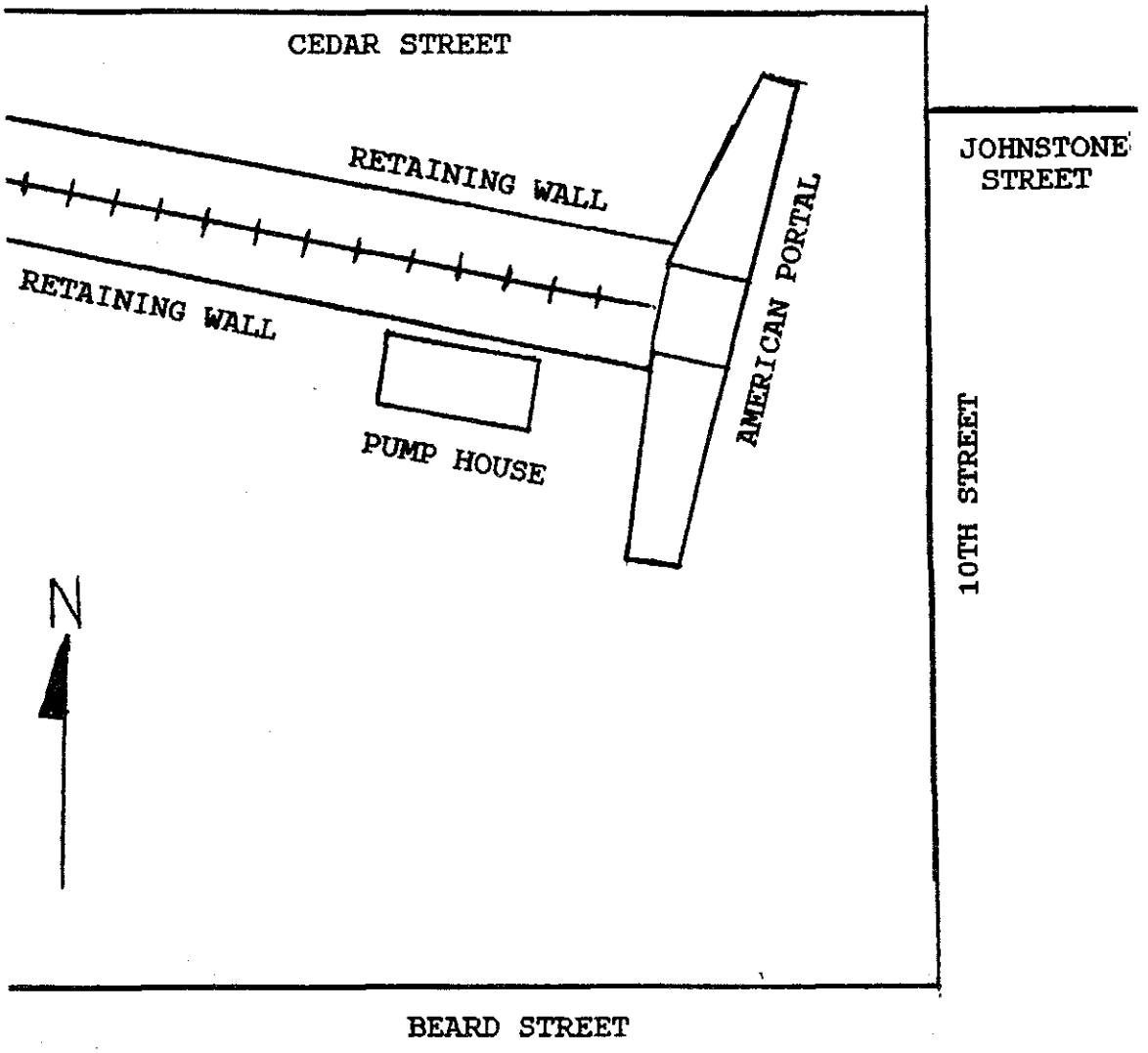
PORT HURON, MICHIGAN QUADRANGLE
UTM: 17.383080.4759160



SITE PLAN, 1891



SITE PLAN, ca. 1910 - 1993



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1993 FLOOR PLAN